Original claim numbering:

1. (currently amended) A method of electromagnetic field detection comprising:

providing ~~a~~three electromagnetic axial gradiometers in an electromagnetic field, ~~the~~ each electromagnetic gradiometer having at least first and second electromagnetic field vector sensors connected in a differencing arrangement; and

~~controllably altering a position of the at least first and second field vector sensors~~angularly displacing each electromagnetic gradiometer about a respective axis relative to the electromagnetic field during operation of the electromagnetic gradiometer, wherein the respective axis of each gradiometer is not parallel to a respective axis of any other of the gradiometers; and

determining from output signals of the three electromagnetic gradiometers components of a gradient tensor of the electromagnetic field and components of the electromagnetic field.

2. (cancelled)

3. (cancelled)

4. (currently amended) The method of claim ~~3~~ 1 wherein ~~controllably altering~~angularly displacing each gradiometer ~~the position of the at least first and second field vector sensors~~ is performed by rotating the ~~at least first and second field vector sensors~~ gradiometer continuously during operation of the gradiometer.

5. (previously cancelled)

6. (currently amended) The method of claim ~~3~~ 1 wherein ~~controllably altering~~ angularly displacing each gradiometer ~~the position of the at least first and second field vector sensors~~ is performed by rotating the ~~at least first and second field vectors~~ gradiometer piecewise about ~~an~~ the respective axis ~~of rotation~~.

7. (currently amended) The method of claim ~~3~~1, wherein the respective axis of rotation of each axial gradiometer is positioned substantially perpendicular to the axial alignment of the first and second field vector sensors, substantially between the first and second field vector sensors, and substantially equidistant from the first and second field vector sensors.

8-9. (previously cancelled)

10. (currently amended) The method of claim 1 wherein the ~~gradiometer is an axial magnetic gradiometer, and wherein the~~ field vector sensors of the axial magnetic gradiometer are one of: SQUIDs, flux gates and superconducting pick up-loops.

11-13. (previously cancelled)

14. (previously amended) The method of claim 10 wherein the sensitivity vectors of the field vector sensors lie substantially in a nominal x-y plane, and wherein the axial magnetic gradiometer is rotated about a nominal z-axis perpendicular to the x-y plane.

15. (previously cancelled)

16. (cancelled)

17-19. (previously cancelled)

20. (currently amended) An electromagnetic field detection device comprising:

~~a~~ three electromagnetic axial gradiometers, ~~the~~ each gradiometer having at least first and second field vector sensors connected in a differencing arrangement; and

means for ~~controllably altering~~angularly displacing each electromagnetic gradiometer about a respective axis ~~the position of the at least first and second field vector sensors~~ relative to an electromagnetic field during operation of the electromagnetic gradiometer, the respective axes being non-parallel; and

processing means for determining from output signals of the three electromagnetic gradiometers components of a gradient tensor of the electromagnetic field and components of the electromagnetic field.

21. (cancelled)

22. (cancelled)

23. (currently amended) The device of claim ~~22~~ 20 wherein the means for ~~rotating the at least first and second field vector sensors about the axis of rotation~~ angularly displacing each electromagnetic gradiometer is operable to rotate ~~the at least first and second field vector sensors~~ each gradiometer continuously during operation of the gradiometer.

24. (previously cancelled)

25. (currently amended) The device of claim ~~22~~20, wherein the means for ~~rotating the at least first and second field vector sensors about the axis of rotation~~ angularly displacing each

electromagnetic gradiometer is operable to rotate ~~the~~ each gradiometer piecewise about the axis of rotation.

26. (currently amended) The device of claim ~~22~~ 20, wherein the respective axis of rotation of each axial gradiometer is positioned substantially perpendicular to the co-axial first and second field vectors, substantially between the first and second field vector sensors, and substantially equidistant from the first and second field vector sensors.

27-28. (previously cancelled)

29. (currently amended) The device of claim 20, wherein the ~~gradiometer is an axial gradiometer, and wherein the~~ field vector sensors of the axial magnetic gradiometer are one of: SQUIDs, flux gates and superconducting pick up-loops.

30-32. (previously cancelled)

33. (currently amended) The device of claim 29 wherein the sensitivity vectors of the field vector sensors of each gradiometer lie substantially in a nominal x-y plane, and wherein the means for ~~controllably altering the position of the at least first and second field vector sensors~~ angularly displacing each electromagnetic gradiometer comprises means for rotating the at least first and second field vector sensors about a nominal z-axis perpendicular to the x-y plane.

34. (previously cancelled)

35. (cancelled)

36-38. (previously cancelled)

39. (cancelled)

40. (cancelled)

41-43. (previously cancelled)

44. (currently amended) The method of claim ~~39~~ 1 further comprising distinguishing field gradient information from field information in the Fourier domain.

45. (currently amended) The method of claim ~~40~~ 1 further comprising distinguishing information about the $g_{xy}$ component of the gradient tensor from information due to the diagonal gradient components, even at the same frequency.

46-50. (previously cancelled)

51. (currently amended) The method of claim ~~39~~ 1 wherein DC offsets are determined and monitored to provide information about the operating conditions of the gradiometers, and wherein the DC offsets comprise one or both of: low frequency drift in at least one field vector sensor of the at least three gradiometers; and the fixed offset of at least one field vector sensor of the at least three gradiometers.

52-53. (previously cancelled)

54. (currently amended) The method of claim ~~39~~ 1 wherein the at least three gradiometers are rotated at differing frequencies, in order to facilitate separation of their data signals in the Fourier domain.

55. (cancelled)

56. (cancelled)

57-59. (previously cancelled)

60. (currently amended) The device of claim ~~55~~ 20 wherein the at least three gradiometers are rotated at differing frequencies, in order to facilitate separation of their data signals in the Fourier domain.

61. (previously cancelled)

62. (currently amended) The device of claim ~~55~~ 20 further comprising means for detecting and measuring a DC offset, wherein the DC offset comprises one or both of: low frequency drift in at least one field vector sensor of the at least three gradiometers; and the fixed offset of at least one field vector sensor of the at least three gradiometers.

63-65. (previously cancelled)

66. (currently amended) The device of claim ~~55~~ 20 further comprising means for distinguishing field gradient information from field information in the Fourier domain.

67-72. (previously cancelled)